Name:

Date:

Period:

NUMB3RS Activity: *Barging In*

(Typed by Spencer W.)

In “Finders Keepers,” the body of a diver is found in the ocean. The body is traced to a salvage barge that has a bloody handprint on it. After further Investigation, it is discovered that the blood is not from the dead diver, but someone else who was murdered on the barge. The ocean is a big place and Don knows he needs Charlie’s help to identify a search area to look for the other victim.

Charlie uses some specific information about the barge’s last voyage to determine the maximum search radius. In particular, Charlie learns that the barge consumed 68 gallons of fuel on its last voyage, and the engine log shows that the barge was out for 16 hours. From this, Charlie calculates that the barge could not have traveled more than 20 miles. Because the barge started and ended its trip at the same location, he concludes that the missing bodies must be within a 10-mile radius of the dock.

1. Estimate (or research) the maximum speed for the salvage barge. About how far could the barge have traveled in 16 hours?
2. If the barge traveled only 20 miles as Charlie suggested, what was its average speed?
3. How does your estimate from Question 1 compare with Charlie’s estimate? What might explain the difference?
4. The fuel efficiency of a salvage barge is about 500 ton-miles per gallon. That is, one gallon of fuel can move a one-ton barge about 500 miles. Complete the table below.

|  |  |  |
| --- | --- | --- |
| Barge Weight (tons) *w* | Amount of fuel (gallons) *f* | Distance (miles) *d* |
| 1 | 1 | 500 |
| 1 | 2 |  |
| 2 | 1 |  |
| 10 | 1 |  |
| 50 | 1 | 75 |
|  | 15 | 2 |
| 500 |  |  |

1. Write a rule that describes the relationship between the barge weight (*w*), the amount of fuel (*f*), and the distance that the barge can travel (*d*).
2. Assume that the salvage barge weighs 1,500 tons. How far can it travel on 68 gallons of fuel?
3. How does your estimate from Question 6 compare with Charlie’s estimate of 20 miles? What might explain the difference?
4. Which constraint gives a better estimate for the distance traveled by the barge: the number of hours in the engine log. Or the amount of fuel that was consumed? Justify your answer.